WORLD HEALTH ORGANIZATION

ORGANISATION MONDIALE DE LA SANTE

19 October 1963

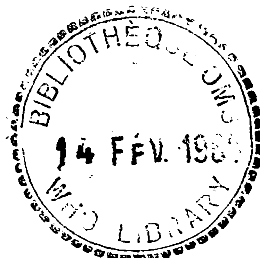
ORIGINAL: ENGLISH

a 38658

Supplement to WHO/Mal/418

CONTENTS

		Page
1.	In memoriam - Dr Don E. Eyles	2
2.	In memoriam - Dr Rene G. Rachou	4
3.	External cross-checking of blood slides	5
4.	Reasons for failure in a malaria eradication programme	5



1. IN MEMORIAM

Dr Don E. Eyles

Dr Don E. Eyles died on 4 October 1963 of coronary thrombosis on board ship in Penang, Malaysia, a few hours before he and his family were due to return to the United States of America. This sudden death of an outstanding scientist and excellent colleague was particularly tragic as Dr Eyles was about to retire after 24 years' work for the United States Public Health Service to join the Lahore (Pakistan) unit of the Institute of International Medicine of the University of Maryland School of Medicine.

Dr Don E. Eyles was born in 1915 in Atlanta, Georgia, and obtained his M.S. (Biology) at Emory University and his Sc.D. at Johns Hopkins University in Baltimore.

During the early period of his academic life, he was interested in ornithology and medical entomology, but later, much of his work was connected with studies on malaria imported into the United States of America by returning servicemen, and with the curative action of drugs against relapsing malaria infections. The difference between the effect of pyrimethamine and primaquine on the tissue forms of malaria parasites became clear as a result of this work. The curative action of pyrimethamine and sulfadiazine, and the synergistic effect of these drugs in toxoplasmosis were reported by Eyles and his co-workers in 1952 and these findings were promptly confirmed in acute and chronic forms of the disease. Much knowledge of the epidemiology of toxoplasmosis was due to the work of Eyles on the relationship between the infection in domestic animals and its transmission to man.

In 1960 Eyles, taking a clue from his accidental laboratory infection, showed that Plasmodium cynomolgi bastianellii of monkeys can be transmitted to man through a mosquito. This started much new and still expanding research on the possibility of simian malaria as an anthropozoonosis.

In 1961 Dr Eyles was given the task of establishing a research unit of the United States Public Health Service in Malaya and he went to the Far East accompanied by his wife and three children. The research unit was set up at the Institute for Medical Research in Kuala Lumpur and within less than three years Eyles and his Malaysian, American, British and Australian colleagues produced a remarkable series

of studies which have greatly extended our knowledge of simian malaria. Five new species of malaria parasites of Malaysian monkeys and of a small deer were discovered and their relationship to a number of anopheline vectors was established.

A new area for further research of considerable fundamental and practical importance was thus opened in a field that until recently seemed to be uninspiring and well trodden. The impetus given in this way to the investigation of simian malaria was characteristic of Eyles' vision, determination, leadership and phenomenal energy. During the past year, Eyles was greatly interested in the problem of resistance of human plasmodia to synthetic drugs and particularly 4-aminoquinolines. He left a number of papers which are now awaiting publication.

Some of us who saw Dr Eyles in September at the International Congresses of Tropical Medicine in Rio de Janeiro and who heard his summary of the work carried out in Malaya, could not help saying that he seemed to be in a hurry to complete one job to start another.

Eyles' work has resulted in over 100 publications. He has demonstrated his ability as an administrator of a research laboratory and his versatility as an investigator of general and specific problems in parasitology. One of Eyles' most important assets was his ability to work with a team; he has undoubtedly stimulated in others as much research as he has been personally responsible for. His proficiency in experimental work in parasitology was equalled by his general knowledge of ornithology, botany and entomology. He was an intensely live individual - an inveterate collector of almost anything, biological or otherwise - universally liked and admired by those who have had the good fortune to be associated with him during his short, happy and fruitful life.

2. IN MEMORIAM

Dr Rene G. Rachou

Dr Rene Rachou died in San Salvador, El Salvador, on 21 November 1963 at the early age of 46.

Since April 1960 Dr Rachou had been working as senior epidemiologist in the WHO/PAHO malaria eradication epidemiology team, first in Guatemala and later in El Salvador, studying the problems of continuing transmission of malaria in these countries. During this period, by means of his outstanding techniques in entomology and epidemiology, he developed a methodology of study of these problem areas which will remain an enduring epitaph to him amongst malariologists.

Dr Rachou's post-graduate education was ideally suited to his subsequent life's work. After obtaining his Doctorate of Medicine in the Faculty of Medicine, Rio de Janeiro, Brazil, in 1939, he undertook courses of study in social assistance, malaria, general entomology and hydrobiology, and in 1952 attended the Public Health Course at Johns Hopkins, United States of America. In 1940 he joined the "Serviço de Profilaxia de Malária do Estado de São Paulo" and in 1943 the Brazilian National Malaria Service. From 1954 to 1960 he was Chief, Research Centre of the Departamento Nacional de Endemias Rurais of Brazil.

On many occasions he represented his government at the International Congresses of Tropical Medicine and Malaria and at other conferences and congresses, and he has made numerous contributions to the literature of malaria and of filariasis.

The death of Dr Rachou has deprived the field of malaria of one of its most experienced and dedicated epidemiologists at a time when he was most needed. Our deepest sympathy is extended to his bereaved mother and to his numerous friends in all parts of the world, but particularly those in Brazil and Central America where his life's work took place. As a memorial to him he would wish only that his work has assisted the eradication of malaria in these countries he knew so well.

3. EXTERNAL CROSS-CHECKING OF BLOOD SLIDES

At the fourteenth Regional Committee for South-East Asia in 1961, in resolution SEA/RC14/R5, the Committee noted the rapid progress made in the national malaria programmes in the South-East Asia Region, recognized the importance of adequate laboratory examination of blood films in ensuring the success of these programmes and requested the Regional Director to provide appropriate facilities to governments of the Region for an external cross-checking of a certain percentage of the blood films taken in their national malaria programmes.

Following consultations between the Government of India and the World Health Organization, the former agreed to establish a centre for the external cross-checking of blood slides and to provide the staff required on reimbursement from the Organization.

The Regional Centre for External Cross-Checking of Blood Films was established in June 1963 at the Central Research Institute, Kasauli, India. This centre, which provides an independent service for cross-checking a proportion of the slides that have already been examined by the technicians in the malaria eradication programmes in the Member countries in the South-East Asia Region, is capable of undertaking a workload of 4000 blood slides for examination each month. It has a staff of four senior technicians from the National Institute of Communicable Diseases, Delhi, together with a WHO technician.

During the first three months batches of slides were received from Afghanistan, Burma and Ceylon.

4. REASONS FOR FAILURE IN A MALARIA ERADICATION PROGRAMME

In a report prepared by the technical staff of the WHO/PAHO Regional Office for the Americas on Malaria Eradication in the Americas and the Alliance for Progress (TFH/7 (Eng) 11 March 1963), two keys were reproduced showing the reasons for failures in malaria eradication programmes and the possible causes of persistence of malaria transmission when the method of attack is based on intradomiciliary spraying of dwelling houses with residual insecticides.

These tables give food for thought to all those who are directly or indirectly concerned with malaria eradication. The sooner failures are detected and steps taken to correct them, the quicker transmission will be interrupted and the more economical the eradication campaign will be both for the governments and for the agencies co-operating with them.

Key No. 1

FAILURES IN A MALARIA ERADICATION PROGRAMME

A. Technical

1. Failure to delimit and define the malarious area

2. Lack of knowledge of the period of transmission

(a) Seasonal variations in endemic areas

(b) Frequency of outbreaks or recrudescences in epidemic areas

3. Lack of knowledge of the vector species

(a) Determination and verification of the species

(b) Biology

(c) Behavioural changes

(i) Regional

(ii) Seasonal

(d) Insecticide resistance

(i) Irritability

(ii) Resistance

4. Lack of knowledge of the habits and customs of the population of the area to be sprayed

(a) Prevailing types of dwelling

(b) Use of insecticide for agricultural or health purposes

5. Failure to make suitable plans based on, and in conformity with, the local epidemiological factors

6. Drawing up of a programme beyond the possibilities of a country

7. Over-slow analysis and erroneous interpretation of results

B. Operational

1. Deficient geographical reconnaissance

2. Failure to plan spraying and epidemiological operation

   (a) Badly arranged itineraries

   (b) Lack of personnel

   (c) Deficient training of personnel

   (d) Irregularities and delays in supplies

   (e) Shortage of transport

   (f) Lack of foresight about meteorological factors

   (g) Growth of population

   (h) Other factors

3. Incomplete, deficient, or irregular coverage of the malarious area by the spraying operations

4. Deficiencies in spraying

   (a) Inadequate training

   (b) Inadequate supervision

5. Transport difficulties

   (a) Poor roads

   (b) Road blocks

      (i) Flooding in the rainy season

      (ii) Fall in water level in dry season

   (c) Shortage and other deficiencies of transport

6. Insufficient or inadequate supervision

   (a) Of spraying operations

   (b) Of epidemiological operations

7. Deficient epidemiological evaluation

(a) Lack or poor distribution of notification posts

(b) Insufficient blood samples taken to detect malarious cases in each locality in the malarious areas

(c) Long interval between the collection and the examination of the blood samples by the laboratory

(i) Delay in sending to the laboratory

(ii) Disproportion between number of blood samples sent and number of microscopists available

8. Inadequate control of microscopic diagnoses

9. Epidemiological investigation of cases insufficient to allow of their classification

10. Deficient active case-finding, where this is indicated

11. Failure or deficiency in entomological work

(a) For evaluation of behaviour

(b) Reaction of vectors to insecticides

12. Deficiency, inaccuracy or delay in epidemiological data

(a) In registration

(b) In tabulation

(c) In analysis

C. Administrative

1. Lack of interest in, or understanding of, the programme, on the part of the national executive or legislative authorities of the country, who fail to appreciate or deny it

(a) The importance and priority that the campaign should have

(b) The timely provision of the necessary financial resources

(c) Administrative facility

(d) Proper support

2. Sudden cuts in budgets during operational phases

3. Absence or defects in special malaria eradication legislation

4. Administrative routines that interfere with the efficiency and speed of various measures

5. Lack of co-operation from other departments, directly or indirectly concerned with the campaign

(a) Transport

(b) Communications

(c) Finance

(d) Education

(e) Health

(f) Agriculture

(g) Defence

(h) Others

6. Interference from authorities external to the campaign

7. Absence of authority, autonomy, flexibility of action by the persons responsible for the campaign

8. Shortage of professional and auxiliary workers due to

(a) Unattractive pay

(b) Insecurity of tenure

(c) Uncertain future

9. Difficulty of recruiting and retaining field personnel, due to

(a) Low pay

(b) Type of work assigned

10. Difficulties and deficiencies in providing supplies

11. Defects in preliminary and concurrent planning of administrative services

Key No. 2

POSSIBLE CAUSES OF THE PERSISTENCE OF MALARIA TRANSMISSION WHEN THE METHOD OF ATTACK IS BASED ON THE INTRADOMICILIARY SPRAYING OF DWELLINGS WITH RESIDUAL INSECTICIDES

A. Causes related to spraying operations

1. Sub-total coverage

(a) Houses unsprayed during visit of spraying team

(i) Locked houses
(ii) Owners reluctant

(b) Houses built between spraying cycles

(i) New houses (growth of population)
(ii) New houses (economic and social development)

2. Incomplete coverage

(a) Construction of new surfaces in sprayed houses

(i) Made all at one go
(ii) Made progressively

(b) Replacement of sprayed by new, unsprayed walls

(c) Alterations to sprayed surfaces

(i) Wall-papering
(ii) Washing
(iii) Painting

3. Deficient coverage

(a) Lack of spraying of high walls of houses with "garrets" or "attics" where people sleep

4. Rapid disappearance of insecticide

(a) Sorption of certain mud walls

(b) Alteration of sprayed surfaces by mechanical agents

B. Causes related to types of houses

1. Houses with no walls, with low walls or vents

2. Unsprayed high-roofed houses in which the vector may possibly have acquired the habit of resting (see D.1.(c))

3. Houses with a balcony or veranda

C. Causes related to the habits of the population

1. Displacement of population

2. Staying during early hours of the night on the veranda or balcony or in other unprotected meeting places

3. Passing the night in unprotected shelters

D. Causes related to the behaviour of the vector and its reaction to the insecticide

1. Natural behaviour of the vector

(a) Extra- and peridomiciliary activities

(b) Intradomiciliary activity without resting or with a short rest on interior surfaces of dwellings

(c) Resting place of vectors on the unsprayed, high parts of the house

2. Reaction of vector to insecticide

(a) Irritability

(b) Insecticide resistance

(i) Physiological resistance

(ii) Adaption resistance

(a) Increase in irritability

(b) Change in conduct or behaviour